Research Proposal of the Thesis Entitled

A Study on Modern Operation Management Practices and Their Influence on Operational Efficiency, Healthcare Quality, and Patient Satisfaction in Hospitals

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By

Ashish Raiyani

Enrolment No: 202406020016

Under the guidance of

Dr. Sunil Patel

Professor

In the

Unitedworld Institute of Management

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1. Introduction

From the Japanese Concept of Lean Framework was developed in year of 1950s through Toyoto Production System called TPS, which is based on the assembly line and focuses on eliminating non value added activities which is called Lean Waste, from any System that does not add value to customers in the manufacturing process as well as any service Operations. Since Lean deals with system from a pure process perspective, rather than a hardware perspective, it has been found that lean principles can be readily adopted in other types of processes, such as hospitality, healthcare, corporate operations, and product development process. This way lean principles can be sued to greatly improve the speed and efficiency of all processes

The part of lean is balancing multiple value stream activities of product family as well as services and integrating the work done in operations with rest the management this can be applied in factories, software development, healthcare industries, and hospitality sectors as per customer. The goal of Japanese Concept Lean is to ensure that 100% activities are value-adding, whether they involve physical products or less tangible information such as orders, requests for information, or quotations.

Lean directly deals with meeting exact customer requirements for quicker response, proliferation of product and service offerings, cycle time reducing, eliminating waste (MUDA) in all its forms. The lean approach challenges everything and strives to continuously waste from processes – a fundamental principle that is completely aligned with the goals six sigma. These models are especially towards the impossible is often merely the untried.

Lean in Hospital Management

While Lean was mainly focused on assembly manufacturing plants, where it tends to focus on single-piece flow and eliminates waiting time for Man, Machine and Material. This idea is defined as a Standard practice of any process it can be also apply for Operation Management of Health care industries. Many Operational areas in healthcare are typically designed to handle the most complex transactions. These issues are impact on excessive defects, process delay, and confusion also, Here few example as below

Table No. 1: Here mention 7 Verticals of Healthcare industries with their problem in internal department and several impact of problem on this vertical

Particular	Problem	Impact
Scheduling of Patient Flow	No proper Scheduling of surgeries and appointment for consulting, can lead to overlapping appointments, long patient waiting times, and poor utilization of resources.	Waiting in patient care, increased patient dissatisfaction and Issue of health convert in to risk, and higher stress among hospital internal staff.
Medication Management and Administration	Errors in medication prescription by doctors, readiness, and delivery due to poor communication or	Medication errors, potential loss to patients, and increased in cost of healthcare.

	inadequate systems for tracking medication use.	
Supply chain management and Inventory Control	Mismanagement of medical equipment supplies, such as Stockout of items poor inventory records or slow replenishment, leading to shore capacity or Material Expire due to over inventory	Disruption of clinical procedures, delays in treatment, and increase an operational Cost.
Testing in Laboratory and Diagnostic	Delay processing lab results due to inefficient workflow or technical issues in instruments, or sample mismatch	long hospital stays, delay in diagnosis and treatment, and poor patient satisfaction.
Admission and Discharge Processes	Cumbersome administrative processes for admission patient and discharge, leading to extend in time of Process.	Increased length of stay, delay access to beds for new patients, and reduced throughput capacity of resources.
Communication and Coordination of Internal department	Lack of understanding between internal departments (e.g., emergency, radiology, surgery), leading to fragmented care and errors in patient treatment management.	Delay in interventions, increased patient handoff errors, and confusion between department
Handling of Critical Care Transitions	Inefficiency in transitioning patients among different levels of care, such as from the ICU to the general or from inpatient to outpatient service.	Increased risk of adverse events, delay in recovery, and increased readmission rates of treatment.

Lean Tools

For Eliminating the lean waste their various Lean tools are used. Here mention details with extraordinary benefits of Lean tools.

5S

5S tool are widely applicable for Shopfloor Management and its distinguish between normal (before) and abnormal (after) conditions at a glance. 5S found for reduce searching time, Zero Errors, Improve Safety our Process and service through manpower involvement. Is prior to implementing Lean in industries or in Operational System. The need fist to organised than it possible to improve.

Visual Management

Visual Management is tool which eliminate the language barrier, avoid miscommunications Visual Management such as emoji, Graphs, Charts, Sign Board, Floor marking, Safety instructions, Warning, Poka-Yoke instructions etc., it can be displayed all over the Operational Area.

Standard Operating Procedures (SOPs)

All Steps of Process Carried as a instructions should be converted to written as well Pictorial or videos form who call SOPs or WI to remove dependency on skilled person in achieving required product quality level, consistency, effectiveness and efficiency.

Just in Time (JIT)

Just in Time Concept Comes from Japanese philosophy to make the right product or Service in right quantity at the right time right quality and right Place. This makes results in to zero inventory and minimal cycle time.

KANBAN System

KANBAN is total visual Concept which is used in assembly or step by step process with accountability in this concept components are pulled by subsequent work centres and the lot or mass are replenished with the right quantities by the pervious operation to next operation, which reduces the inventory and WIP which is big loss of any process of unwanted components.

Cellular Layout

Its done by Group of product Operations Perform Similarly its divide in to smaller self-contained cell, which reduce unnecessary transportation of product during a operation process its also reduce effort of manpower and material movement.

Value Stream Mapping

VSM covers process Sequency follow, it shows value added and non-value added, and helps to achieve single pcs. flow at best layout of all resources required for making or doing the product or process and reduce ratio of NVA.

PokaYoke or Mistake Proofing

Its a Japanese word Means Mistake Proofing technique used to prevent mistakes occurring at their source of origin Machine as well as process by identifying Cause of occurring, and it finally leads towards Zero Defect situation. Which is also Instructed, Segregate or stop to doing mistake.

Single Minutes Exchange of Diesor Quick Changeover (SMED)

By using innovative methods, changeover time has been reduced to under 10-miniutes, enabling the production and process of smaller batches as per customer demand, its also provide flexibility to any system for add verity in there work.

Total Productive Maintenance (TPM)

TPM comes from TPS involves manpower, maintenance team and management working together to improve overall operations of any machine and Instruments. Manpower’s, who first

identify noisy or vibrating or abnormalities of machine, liquid or air leakages, can be trained to make simple repairs to prevent major and big break downs which increase downtime of any system its formally called CLIT Which means Cleaning, Leakage, Inspection, and Tightening.

Kaizen

It is a Continuous management programme called change for better, which results in immediate change or small change and bottom-line improvement and never end process. It is both for management staff and operations staff are involved in these activities.

7 QC Tools

The 7 QC tools are instruments for analysis to improve the product and services quality. They are used to evaluate the production process, identify the key issues and there root cause, control fluctuations and variability of product quality, and give solutions to avoid future errors.

Jidoka (Low-Cost Automation)

This concept are design equipment with semi-automate process, partial automation is basically less expensive than full automation, and to automatically stop when errors are detected (mistake proofing). After Implementing Jidoka, workers can frequently monitor multiple stations at a same time and many quality issues can be detected immediately rather than at a end process.

Hijunka (Line levleling)

A form of operations required scheduling that levelling volume, product mix, shorter lead time with customer focus. It distributing work evenly over time since each product or variant is proceed more frequently and since smaller batches by inventory.

Six Sigma

In a 1970's, Dr. Mikel Harry, work as a staff engineer at Motorola's Government Electronics Group, have an experience of problem solving by statistically. By using this skill GE's products were being designed and produces at a in little time and with low cost. Subsequently, Dr. Harry began to formulas for applying Six Sigma Methodology at whole Motorola. At a time in 1987, Six sigma was started when Chairman, was Bob Galvin in Motorola. This both man Bill Smith and as an engineer and Dr. Mikel Harry together introduce a 6 Step methodology with focus to reduce defects. Sequency Define, Measure, Analyse, Improve, Control (DMAIC) and improve yield through statistical analysis. Bill Smith is known as the father of Six Sigma Methodology. Subsequently, Allied Signal began under the leadership of Larry Bossidy Implementing Six Sigma. Than General Electrics, in 1995 began under the leadership of Jack Welch the most widespread implementation of six sigma.

General Electric: - It is not a secret society, a slogan For developing and delivering a highly disciplined process Six Sigma helps to focus on it. Six Sigma capable to changed our DNA – it is now the way we work."

Honeywell: - Six Sigma refers for strategy to improve growth and productivity as well as a Quality. As a strategy, it is a way for us to achieve performance breakthroughs. It applies to every function in our company and not just to the factory floor.

Six Sigma are not new. Six Sigma is based on tools that have been around of centuries. For example, Six Sigma relies a lot on the normal curve which was introduced by Abraham de Moivre in 1736 and later popularized by Carl Friedrich Gauss in 1818.

Green Belts, Black Belts, Master Black Belts, Champions and Sponsors have been trained on Six Sigma as a metric and methodology, however very few have experienced or been exposed to Six Sigma as an overall management system and a way of life.

Six Sigma is a Strategic tool who change an organizational approach to performance excellence. It is important for business operations because it can be used both to increase top-line growth and also reduce bottom line costs. Six Sigma can used for:

• It change by applying it across the board for large-scale fundamental changes in whole organization to change processes, atmosphere, and achieve breakthrough results which called Transformation theory for six sigma.

• Transactional theory change by applying tools and methodologies to reduce variability and errors for dramatically improve operational results.

Table no. 2: When people things for Six Sigma, they refer to several facts:

It is a philosophy	It is based on facts & data
It is a statistical for problem solving	It is a structured approach to solve problems or reduce variety of out put
It refers to 3.4 errors or defect per DPMO	It is a focus on customer satisfaction
It refers strong tie-in with bottom line benefits	Metrics, Methodologies, Management.

2. Review of Literature

The Literature review on Lean Framework is ripe with success stories displaying compelling significant operational improvements. The group review by specific area for improvement seemed appropriate in establishing depth and breadth or invite program comparison from an example to the next.

These review are focused in following major area of improvement:

- Patient Discharge and length of patient Stay.
- Emergency Care, Surgery flow and treatment scheduling,
- Laboratories and testing, diagnostic report, revenue cycle of hospital and supply chain of heath care industries.

Talero Sarmiento et al. (2024) provide a comprehensive analysis of Lean healthcare implementing, highlighting it potential to improve patient outcomes, reducing operational cost, and improves overall service efficiency. The study for category of Lean strategies into four main cluster: Process Evaluation and its Improvement, Waste Reduction and Efficiency, Assurance and Control of Quality, and its Strategic alignment and Planning. Healthcare institutions adopting Lean methodologies have reported significant improvement, like streamlined patient flow, reduced waiting times, and maximized resource utilization. However, that type of challenges resistance for change, process complexity, and long-term sustainability remain critical barriers. Despite these issues, Lean healthcare continues to gain traction, lately,

researchers have been trying to understand on integrating new emerging technologies and refining implementation strategies for very broader adoption Lean healthcare is steadily increasing in popularity, with current research efforts dedicated to incorporating new technologies and improving strategies for wider adoption across the healthcare sector. (Talero Sarmiento et al., 2024).

Rooslanda and Ayuningtyas illustrate the capability of lean process for optimization in hospital service quality by eliminate lean waste (MUDA) and improving efficiency. A systematic approach of hospitals implementations lean reveals significant reduction in patient waiting, increase efficiency of service increasing the quality of how satisfied the patients are. For instance, a hospital in China apply same principles to outpatient blood collection reducing patient wating time increasing satisfaction rates from 95.37% to 98.33%. Similarly, these techniques implementing in an emergency ward led to better triage efficiency and improved patient experience, studied also show that lean strategies, such as (VSM) and 5S, have implementing successfully identified and reduced non-value-added activities across in patient and outpatient services. Hospitals globally continue to adopt lean framework for its optimization processes, demonstrate its broad applicability and its potential for sustainable healthcare improvements. (Rooslanda & Ayuningtyas, 2023).

Mahmoud et al. (2021) conduct a scoping review analysing impact of lean frameworks on frontline healthcare professionals. The study reviewed 17 empirical articles and identified mixed affects on lean frameworks on healthcare employees. The positive outcomes included improved teamwork, communication, and poor satisfaction for a job due to workflow better processes and smoother coordination. For example, a U.S. Hospital follows lean principles in its renal therapy process reduced staff workload and improve overall job satisfaction, still the review also highlighted negative consequences such as increase in workload, stress and feeling of dehumanization between staff, particularly when lean implementing focused on efficiency without considering employee engagement. The outcome suggests that while Lean system can enhance hospital quality of work, its success depends on a fair approach that integrated technical improvements with employees well being (Mahmoud et al., 2021)

Talero-Sarminto et al. (2024) highlight the transitional effect of Lean six sigma in healthcare, relating to its roles in improving overall Operational efficiency, costs optimization, and improve patient result. By integrating LSS methodologies, healthcare organization have achieving targeted improvements in process evaluation, wate reduction, and quality assurance. However, challenges such as resistance who don't want to change, more complex in implementing and sustainability problems remain key barriers. The reports also tells for future research in to the integration for emerging technologies, such as AI and industry 4.0, to further advance LSS application in healthcare.

Mc Dermott et al. (2022) conducted a systematic review in healthcare for six sigma, analysing its challenges, organizational readiness and critical success factors of organization. The study found LSS has greatly improved patient capacity, reduced medical defects and enhanced operational efficiency. Key success points include strong leadership, tactical alignment, and adequate training for professional in the health field. Still challenges such as resist to change, absence of management support, and difficulties in sustaining improvements remain prevalent. The review also highlights the value of integrating LSS with new technologies to optimize healthcare process and ensure log-term sustainability (McDermott et al., 2022)

In emergency care, Columbus Regional Hospital, a 325-bed facility in Columbus, Indiana, used Lean & Six Sigma to significantly reduce the length of stay in its emergency department. By applying 5S and standardizing care processes, the hospital achieved a length of stay (LOS) reduction of 26% to 35% based on its accuracy levels, and the number of patients leaving without being seen dropped by 75%. This project generated an $800,000 annual revenue increase (Charles, 2008).

Similarly, Southwestern Vermont Medical Center (SVMC), a hospital with 99 bed in Bennington, Vermont, saw a drastic improvement in on-time operating room (OR) start times after implementing Six Sigma. Before the project, only 12% of surgeries started on schedule, but following the changes, over 89% of surgeries began on time. OR suite turnaround times also improved by 20%, reducing case time by six minutes per surgery. These improvements increased OR capacity and decreased overtime costs. SVMC then analyzed its entire revenue cycle and found that many observation patients were being misclassified. After revising the admission process, the hospital increased revenue by $750,000 (Fairbanks, 2007).

3. Problem Definition

The aim of this research is to evaluate the impact of Morden management techniques, particularly lean and Six sigma methodologies, on the operational effectiveness, quality of care and quality of patient experience in healthcare Organizations. The study seeks to develop a full-scale framework for hospitals to maximize their operations and improve resource utilization, thereby addressing existing issues in healthcare management through a holistic model suitable for resource-constrained setting such as India.

Rational of Study

The literature review shows that implementing Lean and Six Sigma performance improvement methodologies by yields major financial and operational benefits. Still, a closer examination reveals variations in the return on investment between Lean and Six Sigma programs. These difference becomes more apparent when evaluate the distinct impacts of each methodologies on various acute care cost and revenue centres.

Research Gap

Worldwide, there is a lack of an integrated model that effective combination of Lean and Six Sigma to optimize healthcare industries practicing in their daily operations. This gap is especially prominent in resource-constrained environments like under develop country, where such comprehensive frameworks are rarely developed or implemented. The proposed research aims to address this gap analysis by creating a combined model that improves understanding of hospital operations, enabling management to stay informed, data-driven based decisions. These methods aim to support scientific and predictable decision-making processes that deliver high-quality care at a reduced cost while maximizing resource utilization and enhancing its operational efficiency.

As in Indian healthcare sector continually to growth and become more corporatized, financial sustainable and operational efficiency have become paramount. Public hospitals, which are

often less funded and lack accountability, face major challenges in achieving these targets. Financial management is overseen by state government medical officers, who may lack the essential training and skills in efficient fund distribution and resource management. This study wants to address these issues by proposing a systematic approach to optimize hospital daily operations.

Study Phases

The research will be conducted in several phases so we can ensure systematic approach to hospital management:

1. **Mapping Existing Hospital Operations (AS IS - SOP)**: Documenting current procedure and workflow.
2. **Identifying Gaps in Key Hospital Activities and Operations**: Analyzing discrepancies and lack off effectiveness in current processes.
3. **Designing Targeted Management Policies (TO-BE State)**: Proposing ideal operational practices for major hospital departments.
4. **Quantitative Analysis**: Measured Sigma levels & conducting statistical evaluations using regression analysis, discrete analysis, and confirmatory factor analysis (CFA).
5. **Developing a Composite Healthy Hospital Index (HHI)**: Proposing strategic approaches to further enhance overall operational efficiency.

This research having several aims to provide hospital administrators with useful findings to refine management practices. As India moves from a cost-centered care system to one that understand quality-driven healthcare, Six Sigma's focus on defect reduction will play an increasingly important role in minimizing inefficiencies and defects in care delivery. These improvements will result in better health outcomes at lower costs, with enhanced stability, quality, and safety.

Investment in adopt lean and six sigma frameworks for quality transformation are expecting to yield major benefits in the coming decade, eventually becomes standard procedure across the healthcare sector. Just as these methodologies have transformed industrial sectors, they are now being leveraged in healthcare to minimize errors, improve patient services, and lower costs, so this study aims to contribute to this transformative movement.

4. Research Questions

1. Do Lean six sigma practices improve overall day to day efficiency in hospitals?

2. Are Lean Six Sigma methodologies effective in improving the quality of care provided to patients?

3. Does the execution of lean six sigma increase how satisfied patients are?

4. Does an integrated framework of lean and six sigma result in most highly efficient resource utilization and improved operational outcomes in hospitals?

5. Need and Significance of Study

This research is highly significant as it wants to fill vital gap of healthcare management by applying Lean and Six Sigma methodology to improving hospital operations in a resource-constrained setting such in Hospitals. The proposed study will give a robust framework to enhance day to day efficiency, increase rate of quality of care, and increase patient experience By offering a strategic guide for hospital administrators to refine their operational processes, these research can be facilitate the sustainable development of Indian healthcare sector, delivering higher-quality care at less costs. Moreover, the findings could serve as a model for adopting equivalent frameworks in other developing regions, setting a precedent for effective hospital management in resource-limited environments.

6. Research Objectives

1. To evaluate the impact of Lean Six Sigma practices on operational efficiency in hospitals.
2. To assess the quality of care provided by hospitals implementing Lean Six Sigma methodologies.
3. To analyze patient satisfaction levels with and without the implementation of Lean Six Sigma practices.
4. To develop a detailed framework integrating Lean and Six Sigma methodologies for improving hospital operations in resource-limited settings.
5. To propose evidence-based recommendations for hospital management to enhance performance and patient outcomes.

7. Hypothesis

1. **H1:** Implementing Morden Operation Management Methods Like Lean Six Sigma practices significantly improves overall day to day efficiency in hospitals.
2. **H2:** The application of Six Sigma methodologies leads to an enhancement in the overall care experience for patients
3. **H3:** There is a major increase in patient satisfaction following the implementation of Lean and Six Sigma practices in hospitals.
4. **H4:** The integrated framework of Lean and Six Sigma results in smart resource utilization and operational results in healthcare industries.

8. Research Methodology

- **Quantitative Research:** This research will primarily employ quantitative way to measure and analyse the impact of Lean Six Sigma practices on day to day efficiency, quality of care, and patient satisfaction.
- **Descriptive Research:** To describe the current state of hospital operations and the implementation of Lean Six Sigma practices.

Method of Data Collection for Study

1. **Documental Analysis:** Review a records, reports, and performance of hospital for analyse historical data and assess changes in pre and post implementation of Morden Methodologies.
2. **Survey:** A Structured list of question will be distributed to hospital staff and patients to collect quantitative information on operational efficiency, quality of care and satisfaction level of patient.
3. **Interviews:** Semi-structured interview to be taken with hospital administrators and professionals of healthcare to gain qualitative insights into the implementation of Morden practices of Lean and Six sigma.
4. **Observational Studies:** By direct Observation's impact on process of hospital to identify gaps and assess the effect of lean and six sigma practices.

Source of Data

- **Primary Data:** data to be collected by doing surveys, interviews, and observational studies conducted in hospitals.
- **Secondary Dara:** data to be taken from hospital records, reports, academic journals, and previous studies related to Lean Six Sigma in healthcare settings.

Selection Criteria for Sample

Inclusion Criteria

1. **Standard Operating Procedures (SOP) defined:** A Hospital which is clearly defined SOPs for their Operation process will be include in the study to ensure that evaluation can be done based on standardized and repeatable processes.
2. **Lean and Six sigma methodologies utilization:** A Hospitals suing actively Lean and Six sigma Practices, particular for those employing the Fortis Operating System (FOS) Scorecards, will be included. This will facilitate an analysis of the direct impact of these methodologies on their operational efficiency and care of patient.
3. **Diverse Hospital Types based:** Taken as a sample of various types of hospitals like, public, private, and multi-specialty, Trust, government etc. included to provide a comprehensive overview of the implementation of Lean Six Sigma in different healthcare settings.
4. **Willingly Participate:** A Hospitals that express a willingness to participate in the Study, including allowing access small clinics and their staff and processes foe collect data will be including.

Exclusion Criteria

1. **Ambiguous and Undefined SOPs:** A Hospitals which is lack of Standardization not defined SOPs for their processes will be excluded, as the absence of standardized practices would hinder the ability to assess the effectiveness of Lean Six Sigma methodologies.
2. **Minimum Process Involvement:** A Hospitals in which the processes are minimally defined or poorly documented (i.e., those with insufficient or informal operational practices) will be excluded. This ensures that the focus remains on hospitals with established processes suitable for analysis.
3. **Lean Six Sigma applicability limited:** Hospitals that have not fully implemented Lean Six Sigma practices or have only adopted them in a limited capacity will be excluded. This will help ensure that the research findings accurately reflect the impact of comprehensive Lean Six Sigma implementation.

These Criteria for Sample selection will help to ensure that the research study focuses on hospitals that provide a environmental Suitability for evaluating the effectiveness of Lean and Six sigma practices on operational efficiency, caring quality and patient satisfaction from healthcare.

Sampling

Table no. 3: Targeted population of Healthcare professionals, hospital administrators, and patients in hospital. (Targeted Hospitals as per Below form over 50 to 200 bad setups.)

Sr. No.	Hospital Name	Address	Available Facilities	Type of Hospital
1.	Rajkot Civil Hospital (Pandit Deendayal Upadhyay Government Hospital)	Dhebar Road, Near Sadar Police Station, Rajkot, Gujarat 360001	Emergency care, surgery, maternity services, dialysis, cardiology, orthopedics, burn care unit, trauma care, ICU, government-run healthcare programs.	Government Hospitals
2.	AIIMS Rajkot (All India Institute of Medical Sciences)	Khandheri, Rajkot, Gujarat 360110	Medical research, super-specialty care, emergency services, ICU, advanced diagnostics, tertiary care.	Government Hospitals

3.	ESI (Employees' State Insurance) Hospital	Bhavnagar Road, Rajkot, Gujarat 360003	General medicine, maternity care, surgery, healthcare services for insured workers, outpatient services.	Government Hospitals
4.	Padma Kunvarba Hospital	Palace Rd, Near Gundavadi Police Chowki, Jayraj Plot, Rajkot – 360001	pre-natal and post-natal services for expectant mothers, ensuring their health and the well-being of their babies. It features a Neonatal Intensive Care Unit (NICU) for newborns needing special attention, along with gynecological and pediatric services	Government Hospitals
5.	Wockhardt Hospital	Kalawad Road, Rajkot, Gujarat 360005	Cardiology, neurology, oncology, orthopedics, critical care, ICU, trauma care, advanced diagnostics, surgery.	Multi-Specialty Private Hospitals
6.	Sterling Hospital	150 Feet Ring Road, Opp. Christ College, Rajkot, Gujarat 360005	Emergency care, cardiology, neurosurgery, orthopedics, gastroenterology, nephrology, ICU, diagnostics, organ transplant.	Multi-Specialty Private Hospitals
7.	Synergy Superspeciality Hospital	Near Indira Circle, 150 Feet Ring Road, Rajkot, Gujarat 360005	Cardiology, neurology, nephrology, oncology, orthopedics, critical care, high-end diagnostics, minimally invasive surgery.	Multi-Specialty Private Hospitals

8.	Noble Hospital	150 Feet Ring Road, Near Raiya Circle, Rajkot, Gujarat 360007	Cardiac care, orthopedics, neurology, ICU, trauma care, diagnostics, maternity services.	Multi-Specialty Private Hospitals
9.	Gokul Superspeciality Hospital	Dhebar Road, Rajkot, Gujarat 360002	Kidney care, urology, neurology, cardiology, critical care, dialysis, surgical care.	Multi-Specialty Private Hospitals
10.	Saurashtra Kidney Hospital	Near Neel's City Resort, 150 Feet Ring Road, Rajkot, Gujarat 360005	Urology, nephrology, dialysis, kidney transplants, ICU, diagnostics.	Specialty Hospitals
11.	Giriraj Multispeciality Hospital	Jagnath Plot, Rajkot, Gujarat 360001	Orthopedics, trauma care, plastic surgery, general surgery, emergency care, ICU.	Specialty Hospitals
12.	Sadbhavna Hospital	Dhebar Road, Rajkot, Gujarat 360002	Cardiology, pulmonology, nephrology, trauma care, surgery, emergency services.	Specialty Hospitals
13.	Shree Giriraj Hospital	Kalawad Road, Rajkot, Gujarat 360005	Joint replacement surgery, trauma care, orthopedic surgery, physiotherapy.	Specialty Hospitals
14.	Kasturba Gandhi Hospital	Bhavnagar Road, Rajkot, Gujarat 360003	Maternity care, gynecology, pediatric care, neonatal ICU, general surgery.	Maternity and Childcare Hospitals
15.	Shri Balaji Hospital	Near Hemu Gadhavi Hall, Kotecha Nagar, Rajkot, Gujarat 360005	Maternity services, gynecology, pediatrics, neonatal	Maternity and Childcare Hospitals

			care, general healthcare.	
16.	Giriraj Orthopaedic Hospital	Hospital Chowk, Rajkot, Gujarat 360001	Joint replacement, spine surgery, trauma care, orthopedic surgery, physiotherapy.	Orthopaedic and Trauma Care Hospitals
17.	Ravi Mult speciality Hospital	Rajputpara Main Road, Rajkot, Gujarat 360001	Orthopaedics, trauma care, critical care, surgery, rehabilitation services.	Orthopaedic and Trauma Care Hospitals
18.	Sadguru Hospital	Sadguru Nagar Main Road, Rajkot, Gujarat 360007	General medicine, outpatient services, surgery, basic emergency care.	Small Private Hospitals/Nursing Homes
19.	Parul Sevashram Hospital	Kishanpara Chowk, Rajkot, Gujarat 360001	General healthcare, maternity services, outpatient and inpatient services.	Small Private Hospitals/Nursing Homes
20.	Swasthya Mult speciality Hospital	University Road, Rajkot, Gujarat 360005	Diagnostic services, dialysis, general healthcare, outpatient services, emergency care.	Diagnostic and Dialysis Centres
21.	Guru Govind Singh (G.G.) Government Hospital	Pandit Nehru Marg, Jamnagar 361008	Emergency, trauma, ICU, burn care, maternity, government-run programs, cardiology, dialysis, surgery	Government – Teaching Hospital
22.	Gokul Newtech Hospital	Walkeshwari Nagar, near Samay Travels, Jamnagar	Emergency, maternity, trauma care, ICU, orthopedics, dialysis, surgery	Private – Multi-specialty
23.	Patel Hospital (Bedeswer)	Bedi, Bedeswer, Jamnagar 361009	General medicine, emergency, maternity, surgery, basic ICU	Trust-run Hospital
24.	Aayush Multispeciality Hospital	Ayodhyapuri Road, Savsar Plot, Morbi 363641	Emergency, ICU, surgery, maternity, orthopedics, dialysis, trauma	Private – Multi-specialty

25.	Krishna Multispeciality Hospital	Sanala Road, Morbi 363641	Emergency, ICU, surgery, maternity, orthopedics, cardiology	Private – Multi-specialty
26.	Om Hospital	Ravapar Road, Morbi	General care, maternity, emergency, minor surgery, ICU	Private – Multi-specialty
27.	Sir Sayajirao General (SSG) Hospital	Jail Road, Indira Avenue, Vadodara 390001	Emergency, trauma, ICU, burn care, maternity, cardiology, surgery, dialysis, govt health programs	Government – Teaching Hospital
28.	Sterling Hospital Vadodara	Race Course Circle, Vadodara	Emergency, ICU, cardiology, neurology, oncology, dialysis, maternity, surgery	Private – Multi-specialty
29.	Bhailal Amin General Hospital	Alembic Road, Vadodara	Emergency, trauma care, ICU, cardiology, orthopedics, maternity, dialysis, neurology	Private – Multi-specialty
30.	Baroda Heart Institute & Research Centre	Race Course Circle, Vadodara	Cardiology, cardiothoracic surgery, ICU, emergency, diagnostics	Trust-run – Specialty
31.	Kiran Hospital	Katargam, Surat	Emergency, ICU, organ transplant, oncology, maternity, cardiology, dialysis, orthopedics, trauma	Trust-run – Multi-specialty
32.	Unique Hospital	Varachha Road, Surat	Emergency, ICU, trauma, orthopedics, neurology, maternity, cardiology	Private – Multi-specialty
33.	Apollo Hospitals International	Bhat GIDC Estate, Gandhinagar Highway, Ahmedabad	Emergency, ICU, surgery, organ transplant, cardiology, neurology, oncology, orthopedics, dialysis	Private – Multi-specialty
34.	Civil Hospital Ahmedabad (Asarwa Civil)	Asarwa, Ahmedabad 380016	Emergency, trauma, ICU, burn care, dialysis, surgery, maternity, cardiology, govt-run health programs	Government – Teaching Hospital
35.	Sterling Hospital Ahmedabad	Gurukul Road, Ahmedabad	Emergency, ICU, cardiology, neurology,	Private – Multi-specialty

			orthopedics, surgery, dialysis, maternity	
36.	Shalby Hospital	SG Highway, Ahmedabad	Orthopedics, joint replacement, emergency, ICU, cardiology, neurology, dialysis, maternity	Private – Multi-specialty

Data Analysis - Tools and Techniques

1. **Statistical Analysis Software**
   - Minitab 17.
   - SPSS
2. **Lean Six Sigma Tools**
   - DMAIC Framework and DMADV
   - Value Stream Mapping VSM
   - Control Charts and Flow process
3. **Composite Health Hospital Index (HHI)**
   - **Development and Analysis:**
     - Create a composite index to evaluate overall hospital performance based on selected metrics, allowing for comparison and benchmarking against industry standards.

9. Visible Research Outcomes

Cultural Transformation in Healthcare Industries: Encourage in mindset of continues improvement and foster a data-centric approach between staff and management teams.

Benchmark: Opportunity Provide for benchmark with valuable insights that can serve for other healthcare facilities.

Potential for Scalable Practices: Developing improvement strategy that can be tailored and implemented across various departments or hospitals for border impact.

10. Tentative Chapter Plan

Table No. 4: This table Provides a detailed Research Proposal with Chapter and content of chapter

Sr. No.	Chapter Name
1.	Introduction i. Lean in Hospital Management ii. Lean tools iii. Six Sigma iv. Method Differentiators
2.	Literature Review i. Patient Discharge and length of stay related review ii. Flow of OT and treatment iii. Laboratories and testing

	iv. Diagnostic Report v. Revenue Cycle vi. Supply Chain
3.	Methodology i. Rational of Study ii. Research Gap iii. Study Phases iv. Problem Statement v. Significance of the Research vi. Research Methodology a. Objectives b. Hypothesis c. Type of Research d. Methods of Data collection e. Source of Data f. Sample Selection Criteria g. Sampling
4.	Results i. Data Analysis-Tools and Techniques
5.	Discussion
6.	Conclusion
7.	Reference (APA Style)
8.	Annexure

11. Scope and Limitation of the Study

- Analyse a case study and operational data from selected hospitals.
- Issues faced by healthcare institutions identified in adopting Lean/Lean Six Sigma.
- Showcase best practices and key Indicators for successful execution.
- Investigating the influence of Healthcare organizational culture, workforce readiness, and patient-centric approaches on quality improvement initiatives.

Limitations:

1. **Geographical Focus**: The research is limited to hospitals in Gujrat India and may not represent the implementation status or problems faced by hospitals in other regions of India.
2. **Organizational Diversity**: This research may include private, public and government hospitals, but variability in infrastructure, resource availability, and administrative autonomy can affect comparability.
3. **Data Constraints**: The research is primarily based on secondary data, published literature, and interviews or feedback from hospital staff. The absence of real-time process metrics or longitudinal data may limit the depth of performance review.
4. **Scope of Methodologies**: Only Lean and Lean Six Sigma frameworks are considered. Other quality systems (e.g., NABH, ISO 9001) are beyond the research's scope unless integrated with Lean practices.

5. **Implementation Maturity**: The level of maturity of Lean implementation may vary majorly across institutions, affecting the ability to normalized findings or compare directly
6. **Post-COVID Adjustments**: Many hospitals have undergone recent structural or policy changes due to COVID-19, which may influence process performance and patient expectations—factors that are not independently controlled in this study.

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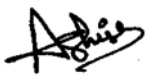
Signature of Research Scholar



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